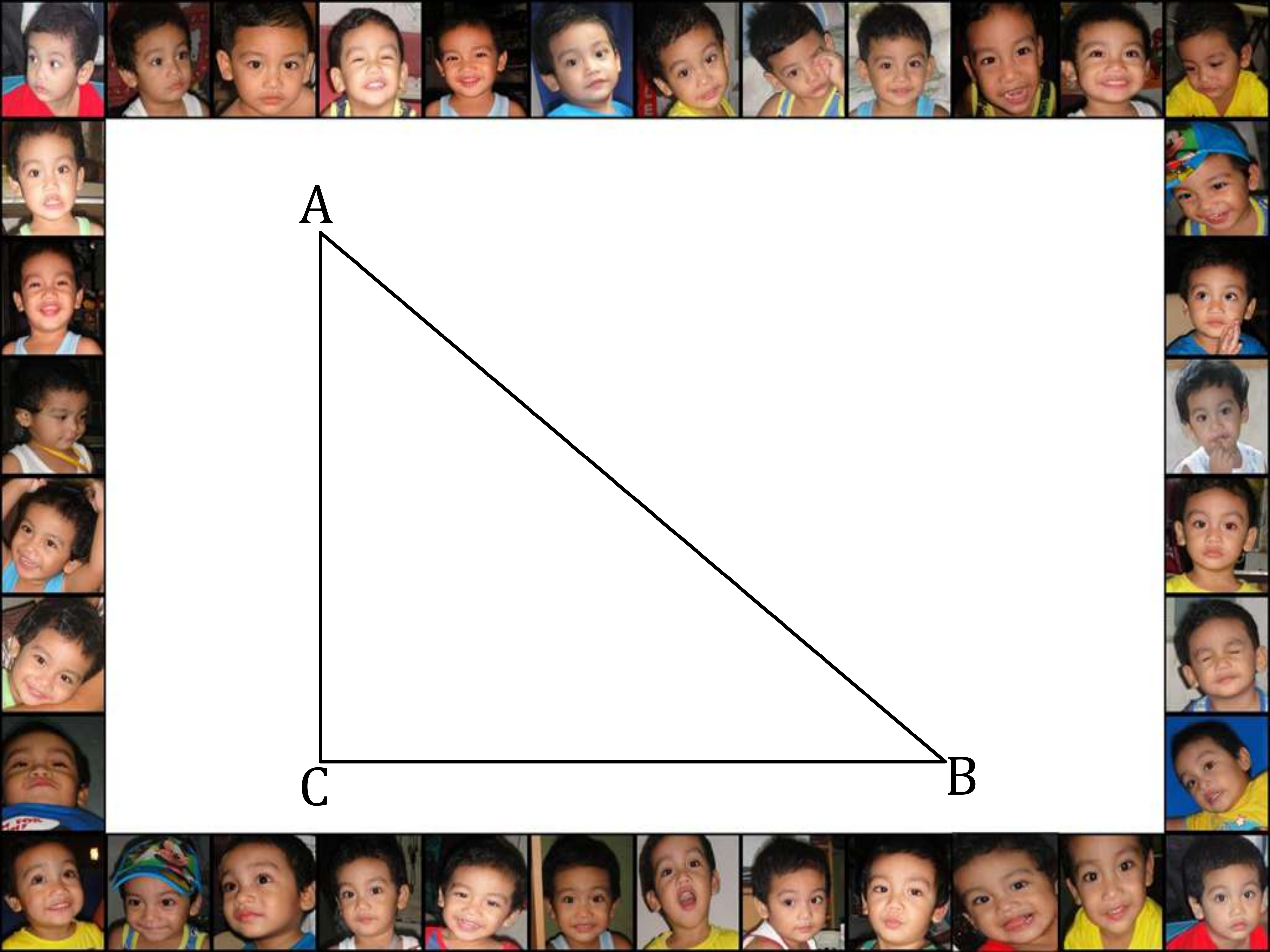
Congruence in Right Triangles

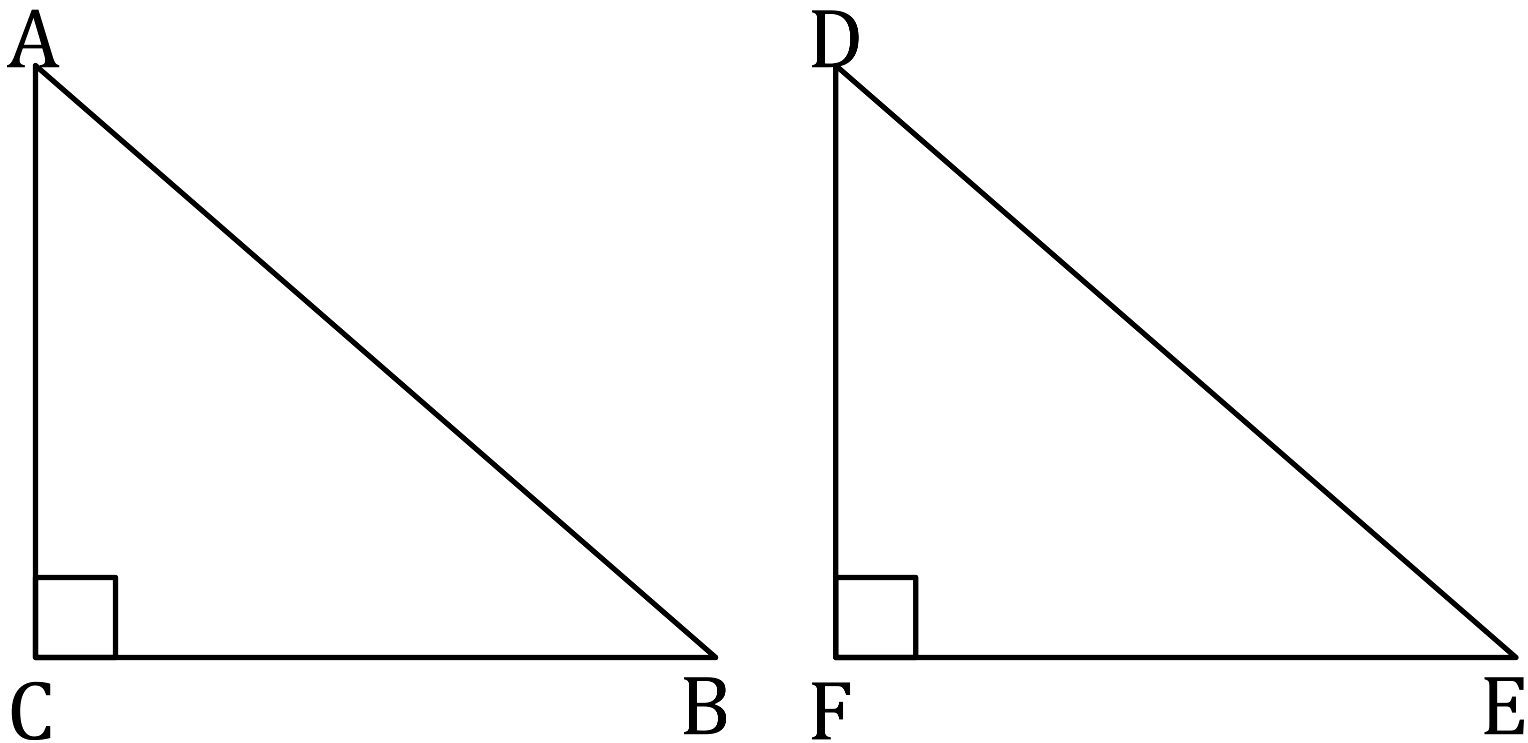
In a right triangle, the side opposite the right angle is the longest side and is called the **hypotenuse**. The other two legs are called **legs**.

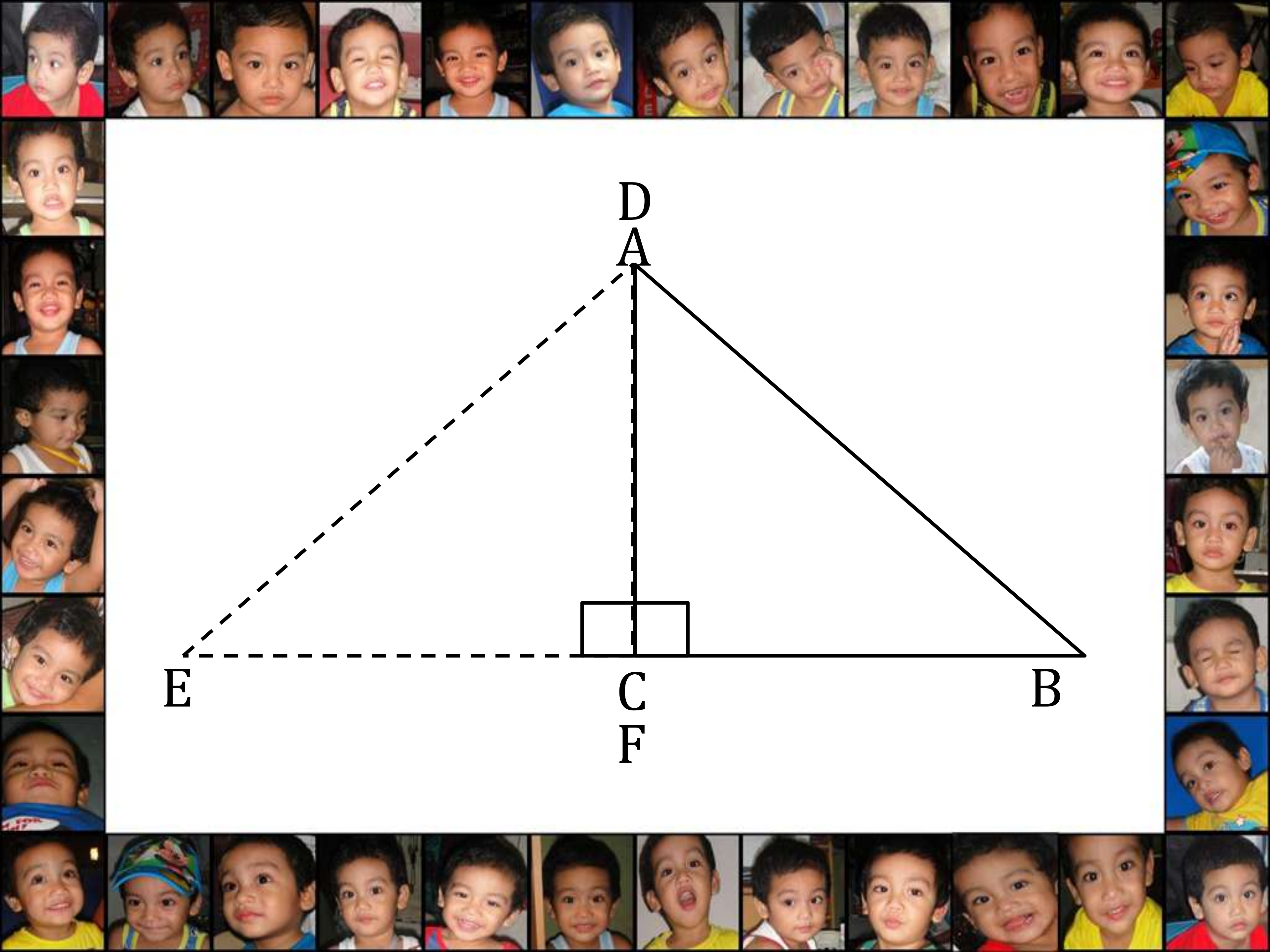
Right triangles provide a special case for which there is an SSA congruence rule. It occurs when hypotenuse are congruent and one pair of legs are congruent.


A
C
B

Hypotenuse-Leg (HL) Theorem

If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.


A
D
C
B
F
E


D
A
E
C
F
B

Steps	Reasons
Right triangles ABC and DEF with right angles C ad F	Given
$\angle ACB \cong \angle DFE$	All right angles are congruent
$\overline{AC} \cong \overline{DF}; \overline{AB} \cong \overline{DE}$	Given
Triangle BAF/BDF is an isosceles triangle	Def of an isosceles triangle
$\angle B \cong \angle E$	Isosceles Triangle Theorem
$\Delta ACB \cong \Delta DFE$	AAS Theorem

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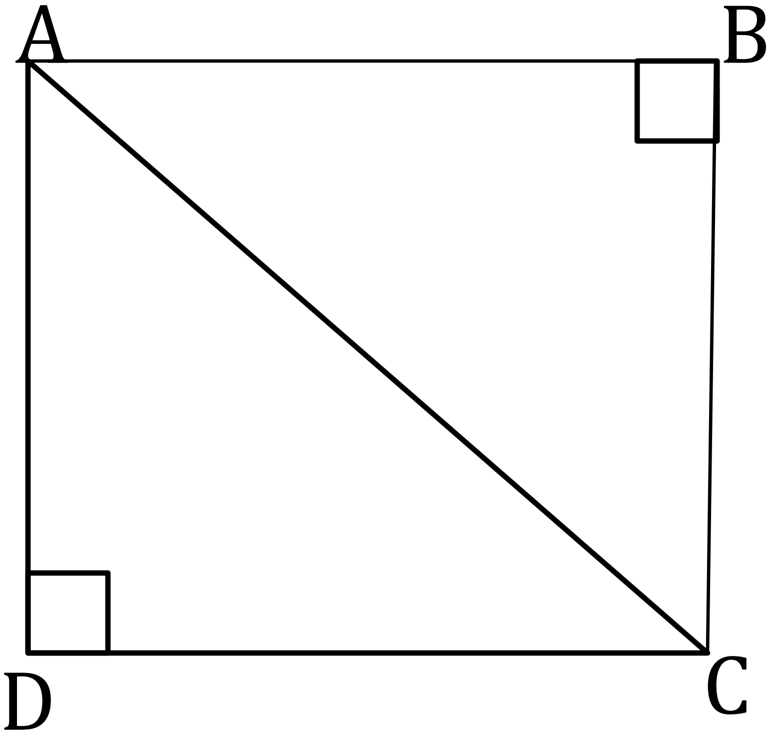
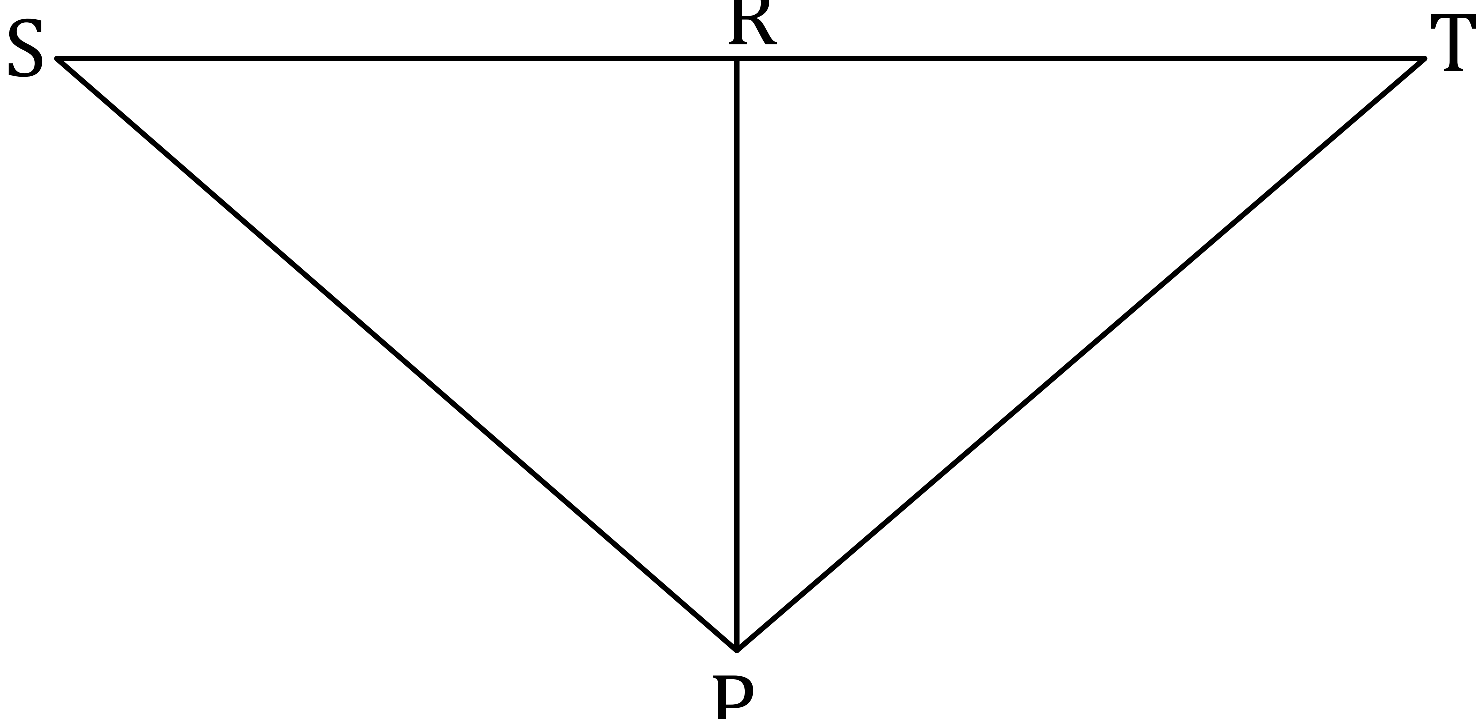
Given: $\overline{AD} \cong \overline{CB}$, $\angle D$ and $\angle B$ are right angles



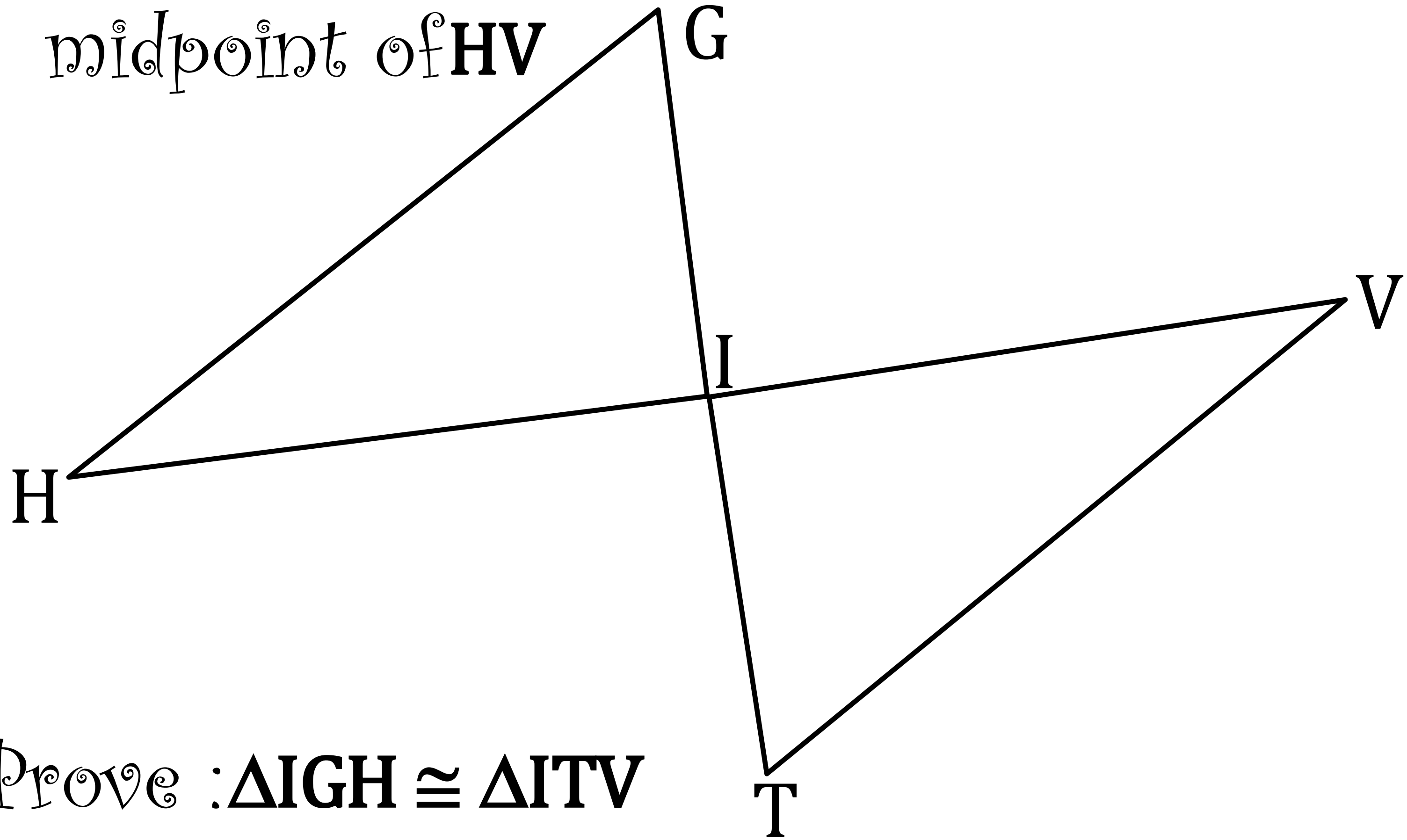
Prove: $\Delta ADC \cong \Delta CBA$

Given: $\overline{PS} \cong \overline{PT}, \angle PRS \cong \angle PRT$



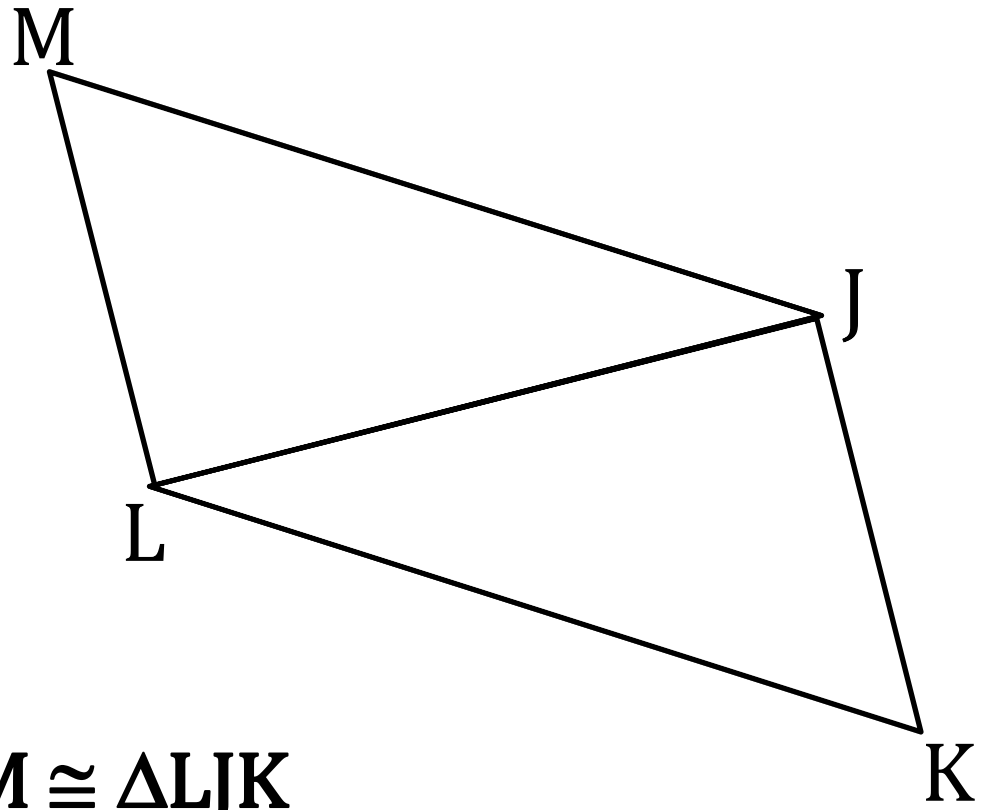
Prove : $\Delta PRS \cong \Delta PRT$

Given: $\overline{HV} \perp \overline{GT}$, $\overline{GH} \cong \overline{TV}$, I is the midpoint of HV



Prove: $\triangle IGH \cong \triangle ITV$

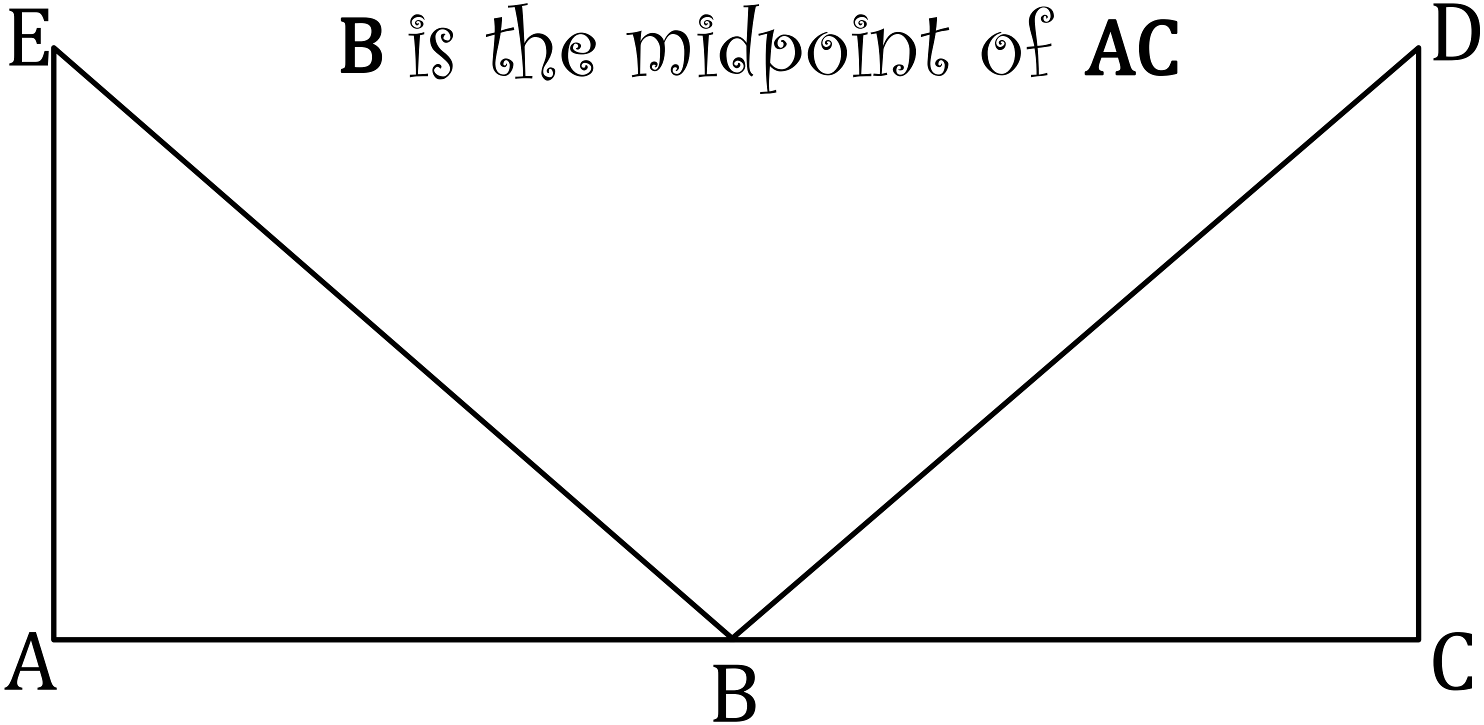
Assignment: Given: $\overline{JL} \perp \overline{LM}, \overline{LJ} \perp \overline{JK}, \overline{MJ} \cong \overline{KL}$



Prove : $\Delta JLM \cong \Delta LJK$

Given: $\overline{EB} \cong \overline{DB}$, $\angle A$ & $\angle C$ are right angles

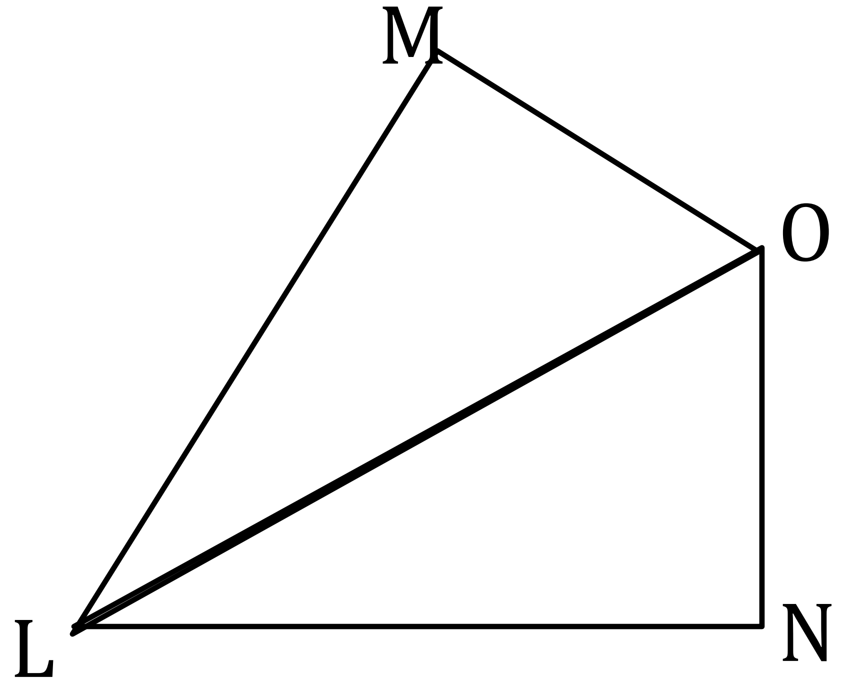
B is the midpoint of $\overline{AC}$



Prove: $\Delta BEA \cong \Delta BDC$

Given: $\overline{OM} \perp \overline{LM}, \overline{ON} \perp \overline{LN}$

$\overline{LO}$ bisects $\angle MLN$



Prove : $\Delta LMO \cong \Delta LNO$